

REFERENCES

- Abdalla, O. (1960). Anatomical study of the female genital system of *Camelus dromedarius* with special reference to the histology of its mucous membrane. Khartoum Univ., Vet. Med. Fac., Thesis.
- Abdalla, O. (1965). Anatomical study of the female genital system of the one-humped camel. I. Ovaries. Sudan J. Vet. Sci. Anim. Husb. 6, 41-52.
- Abdalla, O. (1967). Anatomical study of the female genital system of the one-humped camel (*Camelus dromedarius*). II. The oviducts. Sudan J. Vet. Sci. Anim. Husb. 8, 67-77.
- Abdel-Raouf, M. and El-Naggar, M.A. (1964). Studies on reproduction in camels. I. Mating technique and semen collection. J. Vet. Sci. U.A.R., 1, No 2, 113-119.
- Abdel-Raouf, M. (1965). Studies on reproduction in camels (*Camelus dromedarius*). III. Testicular hypoplasia. Proc. 6th Annual Vet. Congr., Cairo, 125-130.
- Abdel-Raouf, M. and El-Naggar, M.A. (1965). Studies on reproduction in camels (*Camelus dromedarius*). II. The morphology of the camel spermatozoon. J. Vet. Sci. U.A.R., 2, No 1, 1-11.
- Abdel-Raouf, M. and Owaida, M.M. (1974). Studies on reproduction in camels. IV. Gross changes in the morphology of the testis in relation to age and season. Assiut Vet. Med. J. 1, No 1 and 2, 215-223.
- Abdel-Raouf, M., Faith, M.R. and Owaida, M.M. (1975). Studies on reproduction in the camel. V. Morphology of the testes in relation to age and season. J. Reprod. Fertil. 43, 109-116.
- Abdel-Raouf, M. and El-Naggar, M.A. (1976). Studies on reproduction in camels. VI. Properties and constituents of ejaculated semen. VIII. Internat. Congr. Anim. Reprod. & A.I., Cracow, 862-865.
- Abdou, M.S.S., El-Menoufy, A.A. and Ragab, R.S.A. (1983). Cytochemical localization of acid phosphatase (orthophosphoric mono ester hydrolase) in epididymal and ejaculated mammalian spermatozoa. Zuchthygiene 18, 178-183.
- Ali, H.A., Tingari, M.D. and Moniem, K.A. (1978). On the morphology of the accessory male glands and histochemistry of the ampulla ductus deferentis of the camel (*Camelus dromedarius*). J. Anat. 125, 277-292.
- Arnautovic, I. and Abdel-Magid, A.M. (1974). Anatomy and mechanism of distension of the dulaa of the one-humped camel. Acta Anatom. 88, 115-124.
- Arthur, G.H. and Al-Rahim, A.T. (1982). Aspects of reproduction in the female camel (*C. dromedarius*) in Saudi Arabia. Vet. Med. Rev. 1, 83-88.

- Arthur, G.H. Noakes, D.E. and Pearson, H. (1985 a). Veterinary reproduction and obstetrics. 5th Ed. Bailliere & Tindall (Publ.), Eastbourne, U.K.
- Arthur, G.H., Rahim, A.T.A. and Al Hindi, A.S. (1985 b). Reproduction and genital diseases of the camel. Bailliere & Tindall (Publ.), London, U.K., p 110-120.
- Asad, T. (1970). The Kababish Arabs. Power authority and consent in a nomadic tribe. Hurst (Publ.), London, U.K., 263 pp.
- Ayoub, M.M. Youssel, H.I., El-Menoufy, A.A., El-Sayed, M.M., Mossalam, M.M. Nawar, S.M. and El-Shafey, S.M. (1983). Some histoenzymological studies on the epididymis of one-humped camels (*Camelus dromedarius*). Vet. Med. J. Giza 31, 19-34.
- Badawy, A.B.A. and Youssef, H.I. (1982). Some studies on the accessory glands of the male camel (*Camelus dromedarius*). J. Egypt. Vet. Med. Assoc. 42, 105-111.
- Badawy, A.B.A. Ragab, R.S.A. and Youssef, H.I. (1982). Histological and biochemical observations on the accessory reproductive glands of castrated camels. J. Egypt. Vet. Med. Assoc. 42, 113-120.
- Burgemeister, R. (1974). Probleme der Dromedarhaltung und -zucht in Südtunesien. Giessen, Justus Liebig-Univ., Fachber. Veterinärmedizin, Diss.
- Burgemeister, R. (1975). Elevage de chameaux en Afrique du Nord. GTZ, Eschborn, No 21.
- Charnot, Y. (1958). Répercussion de la déshydratation sur la biochimie et l'endocrinologie du dromadaire. Thèse, Sc., Paris.
- Charnot, Y. (1963). Synchronismes de croissance de l'expansion palatale et du testicule en cours de cycle sexuel. Bull. Soc. Sci. Nat. Phys. Maroc. 43, 49-54.
- Charnot, Y. and Racadot, R. (1963). Mise en évidence de catégories cellulaires distinctes dans le lobe antérieur de l'hypophyse du dromadaire. Bull. Microsc. appl. 13, 144-148.
- Charnot, Y. (1964). Le cycle testiculaire du dromadaire. Bull. Soc. Nat. Phys. Maroc. 44, 37-45.
- Chen, B.X. and Yuen, Z.X. (1984 a). Reproductive pattern of the Bactrian camel. In: W.R. Cockrill (Ed.): The camelid. An all-purpose animal. Vol. I, 364-396. Scand. Inst. Afric. Studies, Uppsala, Sweden.
- Chen, B.X. and Yuen, Z.X. (1984 b). Pregnancy diagnosis by rectal examination in the Bactrian camel. In: W.R. Cockrill (Ed.): The camelid. An all-purpose animal. Vol. I, 399-406. Scand. Inst. Afric. Studies, Uppsala, Sweden.

- Chen, B.X., Yuen, Z.X. and Pan, C.W. (1984). Factors inducing ovulation in the Bactrian camel. In: W.R. Cockrill (Ed.): The camelid. An all-purpose animal. Vol. I, 387-398. Scand. Inst. Afric. Studies. Uppsala, Sweden.
- Curasson, G. (1947). *Le Chameau et ses Maladies*. Vigot Frères, Paris.
- Droandi, I. (1915). *Notizie sul camello*. Governo della Tripolitania, Tripoli.
- Elidarous, A., Mansour, H. and Abdel-Rahiem, A. (1983). Bacterial flora of the genital system of male and female camels. *Zagazig vet. J.* (in press).
- El-Azad, M.A., Bareedy, M.H., Sharawy, S.M., Mansour, H.A. and Nasr, M.T. (1983). On the micro-morphology and histochemistry of the epididymis in adult male Egyptian camel (*Camelus dromedarius*) during the rutting and non-rutting seasons. Annual Conf., Soc. for the study of fertility, Univ. of Manchester, 12-14 July 1983. pp 57.
- Elazeb, E.A. and Musa, B.E. (1976). Early detection of pregnancy in the camel by using biological methods. *Zuchthygiene* 11, 166-168.
- Elias, E., Bedrak, E. and Yagil, R. (1984 a). Peripheral blood levels of progesterone in female camels during various reproductive stages. *Gen. comp. Endocr.* 53, 235-240.
- Elias, E., Bedrak, E. and Yagil, R. (1984 b). Estradiol concentration in the serum of the one-humped camel (*Camelus dromedarius*) during the various reproductive stages. *Gen. comp. Endocr.* 56, 258-264.
- Elias E., Bedrak, E. and Cohen, D. (1985). Induction of oestrus in the camel (*Camelus dromedarius*) during seasonal anoestrus. *J. Reprod. Fertil.* 74, 519-525.
- Elias, E. and Cohen, D. (1986). Parturition in the camel (*Camelus dromedarius*) and some behavioral aspects of their newborn. *Comp. Biochem. Physiol.*, Vol. 84A, No 3, 413-419.
- El-Jack, A.H. (1970). On the anatomy of the male genital system of the one-humped camel. Thesis.
- El-Jack, A.H. (1980). The anatomy of the male genital system of the one-humped camel. *Zentralbl. Veterinärmed. C* 9, 92 ff.
- El Manna, M.M., Tingari, M.D. and Ahmed, A.K. (1987). Studies on camel semen. *J. Reprod. Sci.* (in press).
- El-Naggar, M.A. and Abdel-Raouf, M. (1976). Studies on reproduction in camels (*Camelus dromedarius*). VII. The acid and the alkaline phosphatase activities of the seminal plasma. *Indian Vet. J.* 53, 823-828.

- El-Naggar, M.A. and Abdel-Raouf, M. (1977). Studies on reproduction in camels (*Camelus dromedarius*). VIII. The electrophoretic pattern and the amino acid content of the seminal plasma protein. *Indian Vet. J.* 54, 239-243.
- El Wishy, A.B. and Omar, A.M. (1975). On the relation between testes size and sperm reserves in the one-humped camel. *Beitr. Trop. Landwirt.-Vet. med.* 13, 391-398.
- Gautheir-Filters, H. and Dagg, A.I. (1981). The camel. Its evolution, ecology, behaviour and relationship to man. Univ. Press, Chicago, U.S.A.
- Gupta, A.K., Chowdhary, M.S. and Barket, N.K. (1986). A note on optimum time for service in camel (*Camelus dromedarius*). *Indian J. Anim. Sci.* 48, 324-325.
- Hemeida, N.A., Ismail, S.T., Shahie, Y.M., El-Wishy, A.B. and Kandil, M.H. (1985 a). Seasonal changes in the histology and histochemistry of pars distalis of the pituitary of the one-humped male camel. *J. Egypt. Vet. Med. Assoc.* 45, 139-148.
- Hemeida, N.A., El-Wishy, A.B. and Ismail, S.T. (1985 b). Testicular abnormalities in the one-humped camel (*Camelus dromedarius*). 1st Intern. Conf. App. Sci., 30 Mar.-1 Apr. 1985, Zagazig Univ., 438-449.
- Hemeida, N.A., Ismail, S.T. and El-Wishy, A.B. (1985 c). Studies on testicular degeneration in the one-humped camel. 1st Intern. Conf. App. Sci., 30 Mar. - 1 Apr. 1985, Zagazig Univ., 450-458.
- Hemeida, N.A., Ismail, S.T. and El-Wishy, A.B. (1985 d). Pathological effects on age and season on testes of the one-humped camel. 1st Intern. Conf. App. Sci., 30 Mar. - 1 Apr. 1985, Zagazig Univ., 426-437.
- Higgins, A. (1986). The camel in health and disease. 7. Reproduction and genital diseases of camels. Bailliere & Tindall (Publ.), Eastbourne, U.K., 99, 111-120.
- Ismail, S.T., Hemeida, N.A., Kandil, M.H., El-Wishy, A.B. and Shahien, Y.M. (1985). Histology and histochemistry of the pars distalis of the pituitary of the one-humped male camel (*Camelus dromedarius*). *J. Egypt. Vet. Med. Assoc.* 45, 127-137.
- Jöchle, W. (1975). Current research in coitus-induced ovulation: A review. *J. Reprod. Fertil., Suppl.* 22, 165-207.
- Joshi, C.K., Vyas, K.K. and Pareek, P.K. (1978). Studies on oestrous cycle in Bikaneri She-Camel. *Indian J. Anim. Sci.* 48, 141-145.
- Joshi, C.K., Pareek, P.K. and Vyas, K.K. (1980). Note on the sexual behaviour of She-camel during oestrus. *Indian J. Anim. Sci.* 50, 588.

- Kandil, M.H., Ayoub, M.M., Youssef, H.I., Mosallam, S.M., El-Shafey, S. and Fahmy, M.F.A. (1983). Seasonal changes in the ampulla of ductus deferens of the camel. *Egypt. J. histol.* 6, 409-421.
- Khan, A.A. (1971). Sexual behaviour of the male camel (*Camelus dromedarius*) and some studies on semen. Thesis, Bikanar Univ. of Udaipur, India.
- Leese, A.S. (1927). A treatise on the one-humped camel in health and disease. Haynes and Sons (Publ.), Stanford Lines.
- Mansour, H., El-Azab, M.A., Sharawy, S. and Labib, F. (1982). The morphology of epididymal spermatozoa in Egyptian camel bulls. *Res. Bull. No. 737, Zagazig Univ., Fac. Agric., Egypt.*
- Merkt, H., Böer, M., Rath, D. and Schoon, H.A. (1988). The presence of an additional fetal membrane and its function in the newborn Guanaco. *Theriogenology* 30, 437-439.
- Mobarak, A.M., El Wishy and Samira, M.F. (1972). The penis and prepuce of the one-humped camel. *Zentralbl. Veterinärmed.* 19, 787-795
- Mosallam, S.M.M. (1981). Histological and histochemical studies of the male accessory glands of the adult camel (*Camelus dromedarius*) in the different seasons of the year. Ph.D. Thesis (Histology), Fac. Vet. Med. Cairo Univ., Giza.
- Mukasa-Mugerwa, E. (1981). The camel (*Camelus dromedarius*). A bibliographical review. ILCA Monograph, Internat. Livestock Centre for Africa, Addis Ababa, Ethiopia.
- Musa, B.E. (1969). A study of some aspects of reproduction in the female camel (*Camelus dromedarius*). Khartoum, Univ., Vet.Med. Fac., Thesis.
- Musa, B.E. and Abu Sineina, M.E. (1976 a). Development of the conceptus in the camel (*Camelus dromedarius*). *Acta vet.Yugosl. (Beograd)* 26, 17-24.
- Musa, B.E. and Abu Sineina, M.E. (1976 b). Some observations on reproduction in the female camel (*Camelus dromedarius*). *Acta vet. Yugosl. (Beograd)* 26, 63-69.
- Musa, B.E. and Abu Sineina, M.E. (1976 c). Studies on the allantoic and amniotic fluids of the camel (*Camelus dromedarius*). *Acta vet. Yugosl. (Beograd)* 26, 107-114.
- Musa, B.E. (1977). A new epidermal membrane associated with the foetus of the camel (*Camelus dromedarius*). *Zentralbl. Veterinärmed.* C 6, 355-358.
- Musa, B.E. and Abu Sineina, M.E. (1978 a). Clinical pregnancy diagnosis in the camel and a comparison with bovine pregnancy. *Vet. Rec.* 102, 7-13.

- Musa, B.E. and Abu Sineina, M.E. (1978 b). The oestrous cycle of the camel (*Camelus dromedarius*). *Vet. Rec.* 103, 556-557.
- Musa, B.E. (1979 a). The development, presentation, position and posture of the foetus in the camel (*Camelus dromedarius*). *Sudan J. Vet. Sci. Anim. Husb.* 20, 37-42.
- Musa, B.E. (1979 b). Studies on the ovary of the camel (*Camelus dromedarius*). *Sudan J. Vet. Sci. Anim. Husb.* 20, 51-64.
- Musa, B.E. (1983). Normal parturition in camel (*Camelus dromedarius*). *Vlaams Tijdschr. Diergeneesk.* 52, 255-268.
- Musa, B.E. and Makawi, S. (1985). Involution of the uterus and the first postpartum heat in the camel (*Camelus dromedarius*). *Conf. Anim. Prod. in Arid Zones, Damascus, Sept. 1985.*
- Nawito, M. (1973). Uterine infections in the camel. *Egypt. J. Vet. Sci.* 10, No. 1-2, 17-22.
- Novoa, C. (1970). Review: Reproduction in Camelidae. *J. Reprod. Fertil.* 22, 3-20.
- Osman, A.M. and El Azab, E.A. (1974). Gonadal and epididymal sperm reserves in the camel. *J. Reprod. Fertil.* 38, 425-430.
- Osman, D.I. (1975). On the morphology and histochemistry of the testis of the one-humped camel (*Camelus dromedarius*). M.V. Sc. Thesis, Univ. Khartoum, Sudan, 138 pp.
- Osman, D.I. and Plöen, L. (1986). Spermatogenesis in the camel (*Camelus dromedarius*). *Anim. Reprod. Sci.* 10, 23-26.
- Osman, D.I. Moniem, K.A. and Tingari, M.D. (1979). Histological observations on the testis of the camel, with special emphasis on spermatogenesis. *Acta Anat.* 104, 164-171.
- Rakhimazhanov, G.R. (1975). The evaluation of sexual reflexes in male Bactrian camels. (Russ.). *Temal. Sb. nauch. Trud. Alma Atinsk i. semipalatinsk. Zoovet. Inst.* 29, 114-120.
- Richard, D. (1985). Le Dromedaire et son élevage. *Etudes et Synthèses de L'I.E.M.V.T.*, 67-76.
- Santini, R. (1964). Etude topographique et histologique de l'hypothalamus du dromedaire. *Diplôme d'Etudes supérieures, Rabat, Maroc.*
- Schwarz, H.S., Dolan, Rosemary and Wilson, A.J. (1983). Camel production in Kenya and its constraints. I. Productivity. *Trop. Anim. Health Prod.* 15, 169-178.
- Shalash, M.R. (1965). Some reproductive aspects in the female camel. *World Rev. of Anim. Prod.* 103-109.

- Shalash, M.R. (1980). Reproduction in camels. 9th internat. Congr. Anim. Reprod. & A.I., Madrid, Vol. 11, 559-564.
- Sharma, S.S. and Vyas, K.K. (1971). Factors affecting gestation length in the Bikaneri camel (*Camelus dromedarius*). *Ceylon Vet. J.* 19, 67-68.
- Shawki, M.M., El-Hariri, M.N. and Omar, M.A. (1983). Camel filariosis in Egypt. A. Incidence, hematological and histopathological studies of testes and epididymis. *J. Egypt. vet. Med. Assoc.* 43, 301-308.
- Shehata, R. (1980). A short study of the seminal colliculus in some mammals. *Acta Anatom.* 106, 400-404.
- Singh, V. and Prakash, A. (1964). Mating behaviour in camels. *Indian vet. J.* 41, 475-477.
- Singh, U.B. and Bharadwaj, M.B. (1978). Histological and histochemical studies on the testis of camel (*Camelus dromedarius*) during the various seasons of ages. Part II. *Acta Anatom.* 101, 280-288.
- Tayeb, M.A.F. and Transblin, P.C. (1948). L'appareil génital mâle du chameau. *Rev. Elev. med. vet. Pays trop.* 4, 157-160.
- Tingari, M.D. and Moniem, K.A. (1979). On the regional histology and histochemistry of the epididymis of the camel. *J. Reprod. Fertil.* 57, 11-20.
- Tingari, M.D., El-Manna, M.M., Rahim, A.T.A., Ahmed, A.K. and Hamad, M.H. (1987). Studies on camel semen. I. Electroejaculation and some aspects of semen characteristics. *Anim. Reprod. Sci.* (in press).
- Volcani, R. (1952). Seasonal activity of gonads and Thyroidea in camel, cattle sheep and goats. Jerusalem, Hebrew Univ., Thesis.
- Volcani, R. (1953). Seasonal variations in spermatogenesis of some farm animals under the climatic conditions of Israel. *Bull. Res. Com. Israel* 3, 123-126.
- Watson, R.M. (1969). A census of the domestic stock of inert Eastern Province, Kenya, Mimeo, Nairobi, Kenya, 135 pp.
- Williamson, G. and Payne, W.J.A. (1978). An introduction of animal husbandry in the tropics. 3rd Ed. Longman (Publ.), London, U.K., 755 pp.
- Wilson, R.T. (1984). The camel. Longman (Publ.), London, New York, 83-101.
- Yagil, R. and Etzion, Z. (1980). Hormonal and behavioral patterns in the male camel. *J. Reprod. Fertil.* 58, 61-65.
- Yagil, R. (1985). The desert camel. Verlag Karger, Basel, München.

Youssef, H.I., Ayoub, M.M., Kandil, H.H. and Mosallam, S.M. (1984).
Seasonal changes in the bulbo-urethral gland of one-humped camel.
J. Egypt. vet. Med. Assoc. 44, 101-110.

Zaki, K. and Mousa, A. (1965). The bacterial flora of the cervical canal,
uterine horn and Fallopian tube in native cows and she-camels.
Fortpfl. Haust. Bd. 1, 229-232.

FIGURES

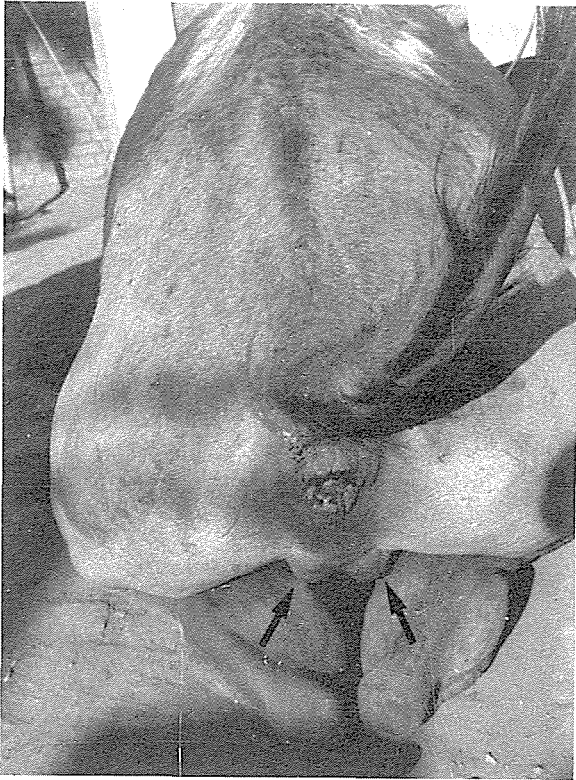


Fig. 1: Normally developed testicles in the camel (arrows).*

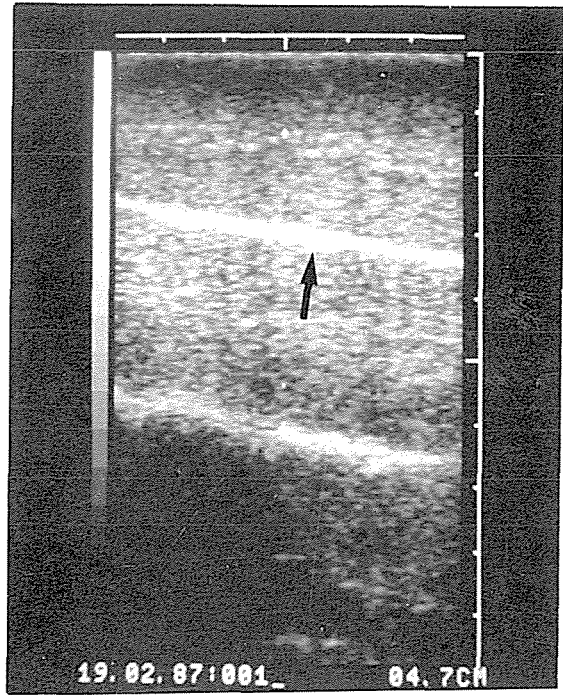


Fig. 2: Ultrasound photograph of a camel's testicle. Note the mediastinum (arrow).*



Fig. 3: Inguinal cryptorchidism of a camel's left testicle.*

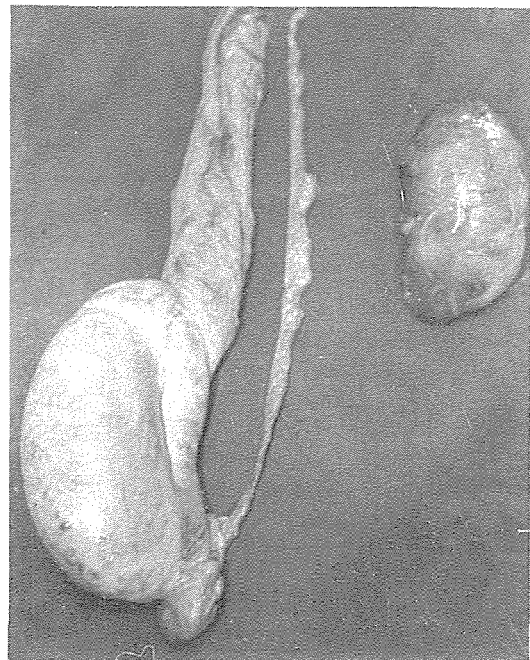


Fig. 4: Normal and inguinal cryptorchid testicle of a camel (material from abattoir). Note the large corpus epididymis of the normal testicle in which most of the semen reserve is being stored.*

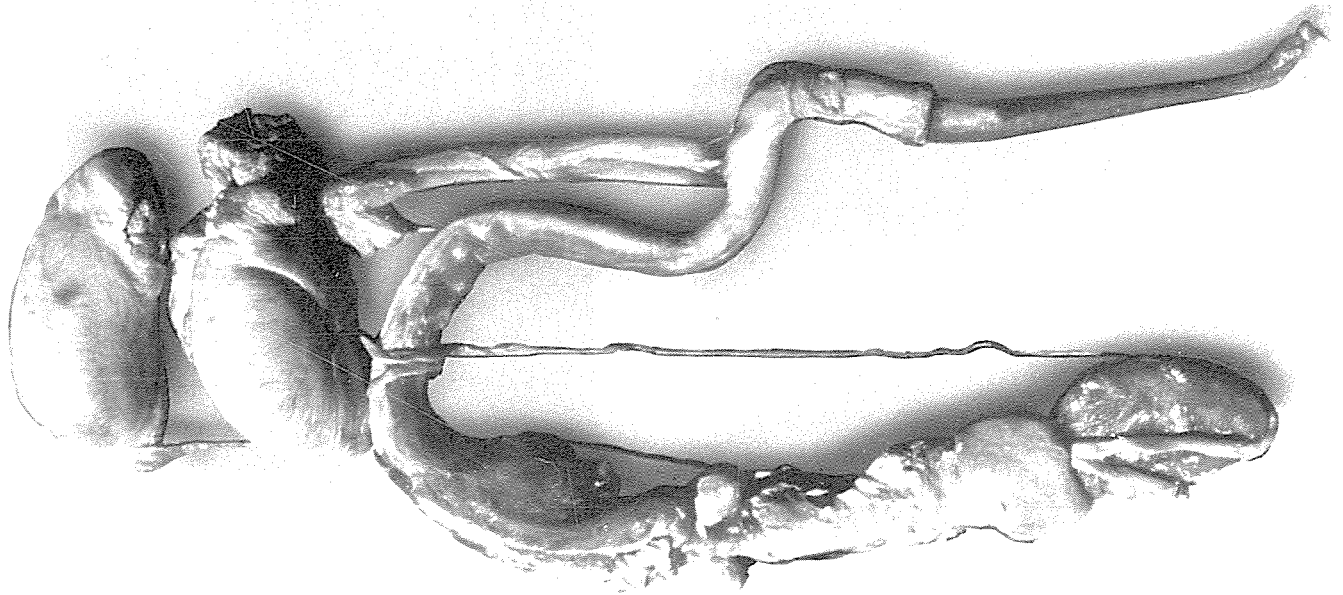
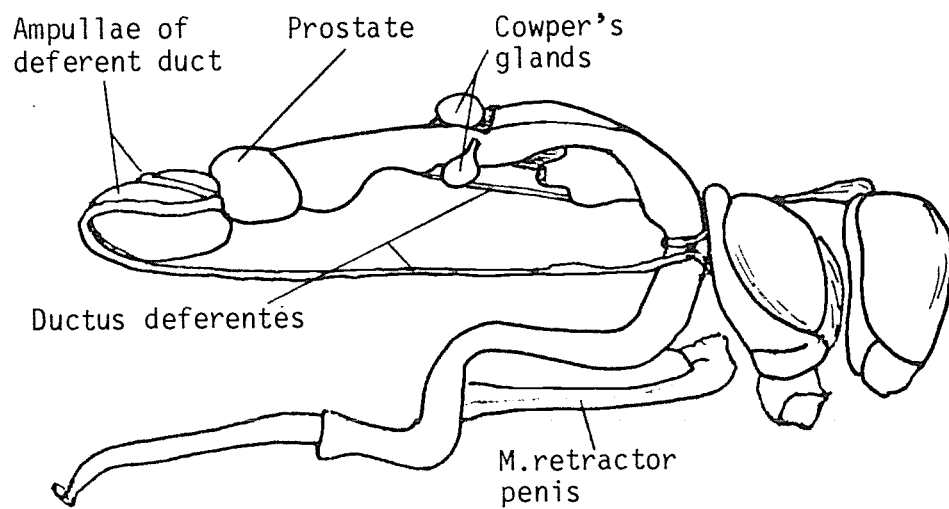


Fig. 5/5 a: Male genital organs of the camel. Note the hook shaped tip of the penis. ***



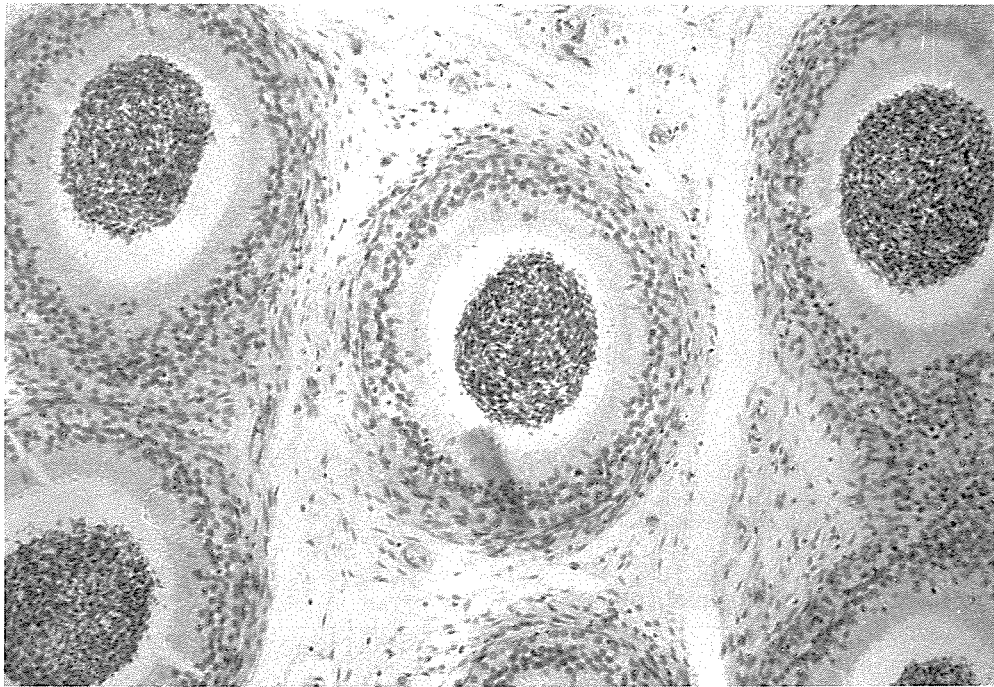


Fig. 6: Histological section of the corpus epididymis of the camel (augmentation 1:400). Note the number of sections through the coiled ductus.*

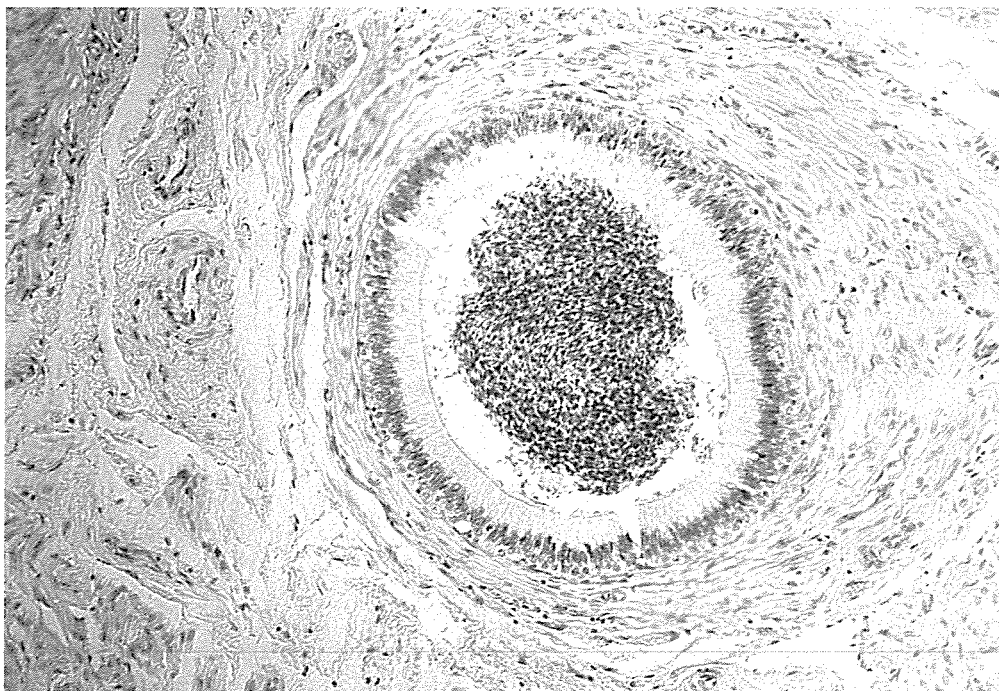


Fig. 7: Histological section of the cauda epididymis (augmentation 1:630). Note, there is only one section through the canal.*

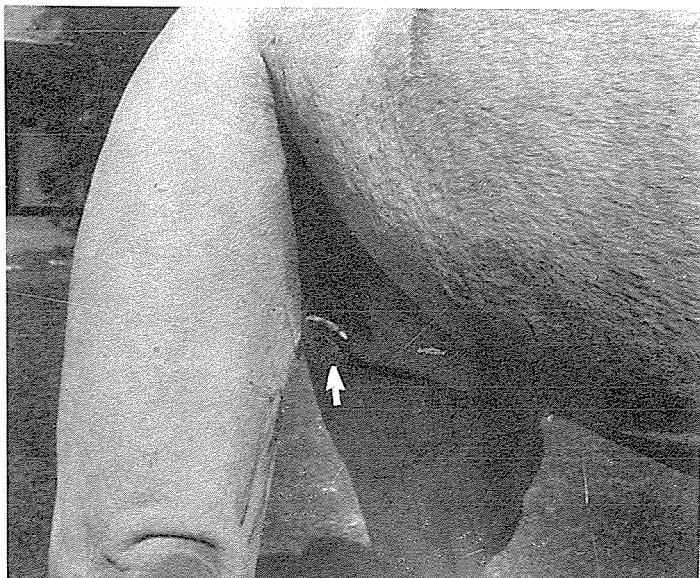


Fig. 8: Rutting male sprinkling the urine backwards. *



Fig. 9: The tail is whisking the urine around. Note the moisture on the hind legs. *



Fig. 10: Female in heat, lifting the tail and urinating. *



Fig. 11: Rutting male smelling the vulva of the female in heat. *



Fig. 12: Rutting male with "flehmen". *

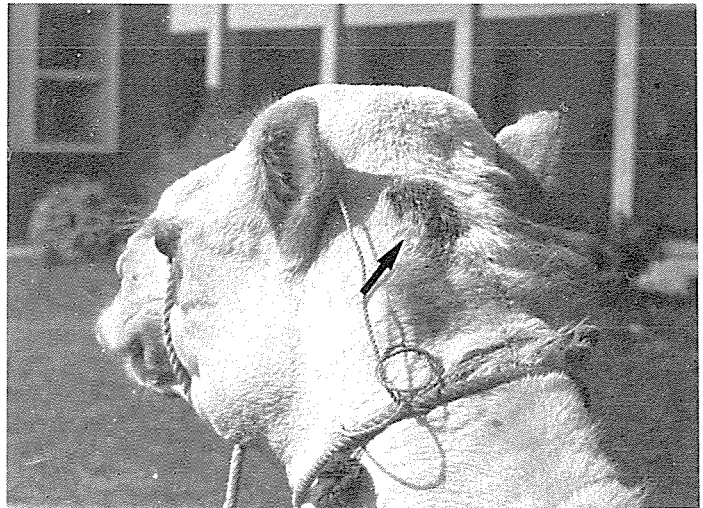


Fig. 13: Poll glands of a rutting male in secretion.*



Fig. 14: Protrusion of the soft palate, the dulaa, a typical symptom of predominantly sexual excitement in the male one-humped camel. *



Fig. 15: Mating behaviour. Note the salivation of the male.*

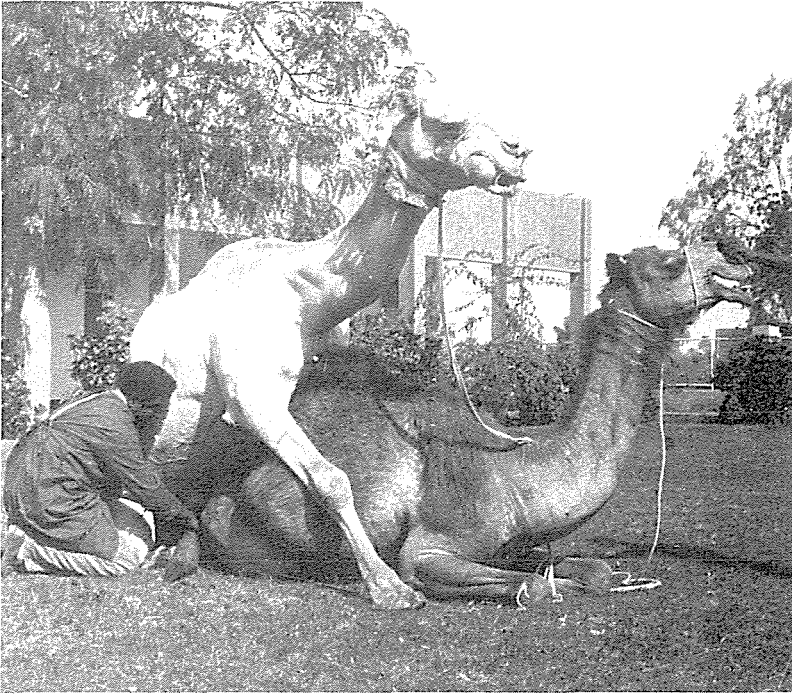


Fig. 16: Semen collection in the camel by means of an artificial vagina. Note the inflated dulaa of the male.*



Fig. 17: Introducing the penis into the artificial vagina. Note the hook shaped tip of the penis.*

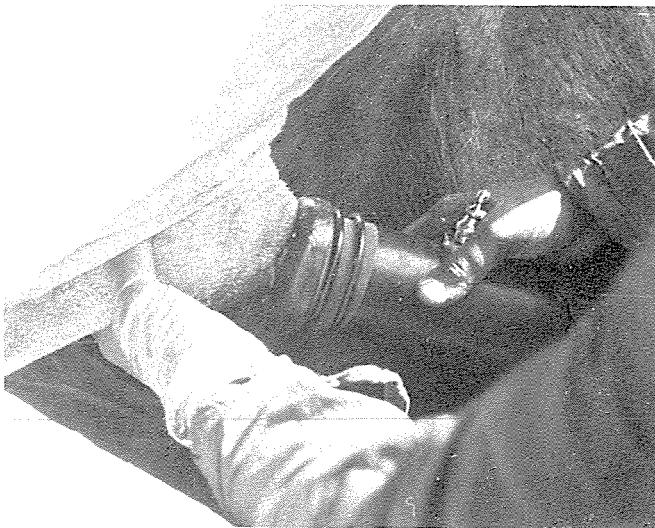


Fig. 18: Position of the artificial vagina during semen collection.*



Fig. 19: Ejaculate of a camel.*

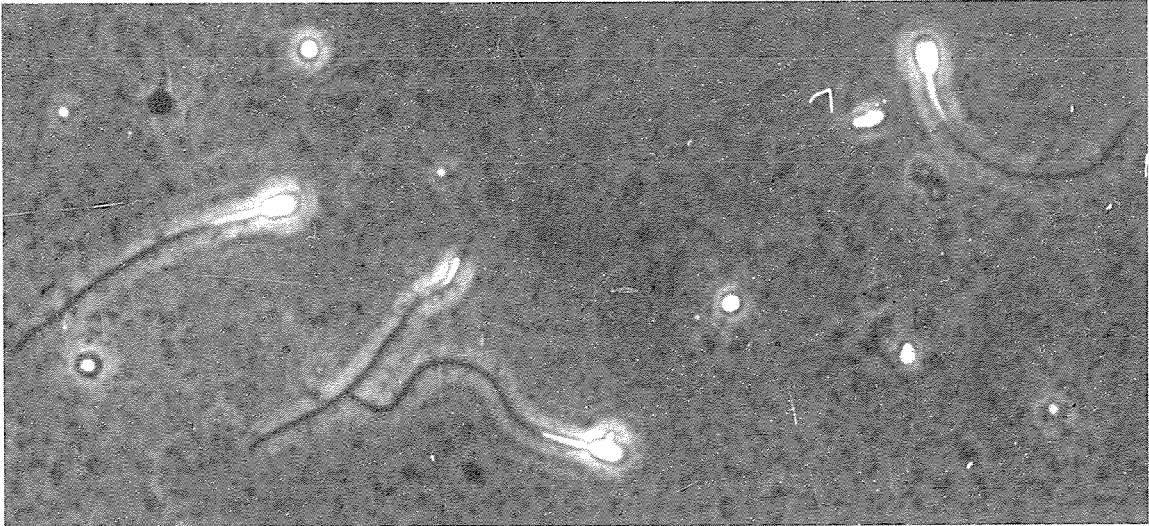


Fig. 20: Sperm cells of the camel
(augmentation 1:320). *

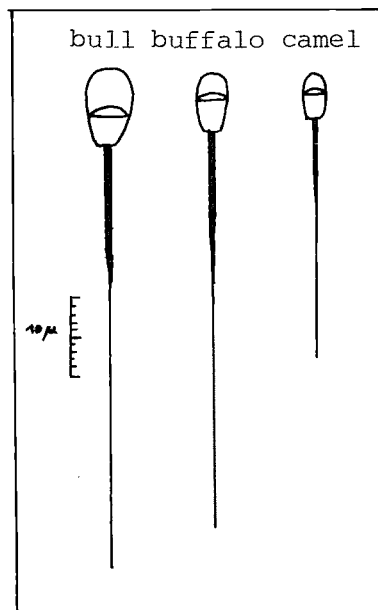


Fig. 21: Comparison of spermatozoa
from bull, buffalo and camel
(after Abdel-Raouf & El-Naggar,
1965). ***

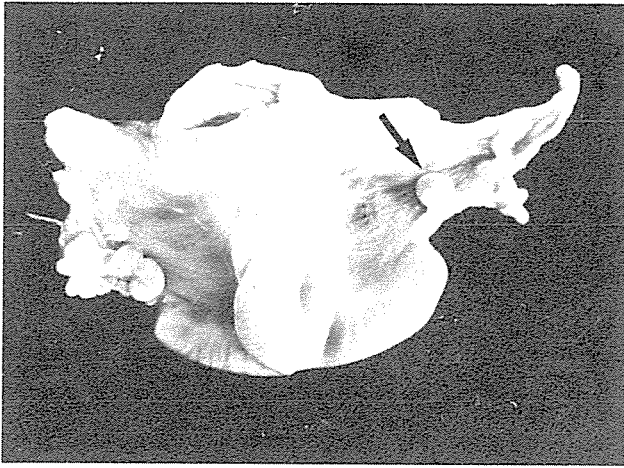


Fig. 22: Uterus and ovaries of a new born camel. Note the ripe follicle on the left ovary. **



Fig. 23: Uterus and ovaries of an adult camel. Note the size of the left horn and the ripe follicle of about 8 cm diameter on the left ovary. **

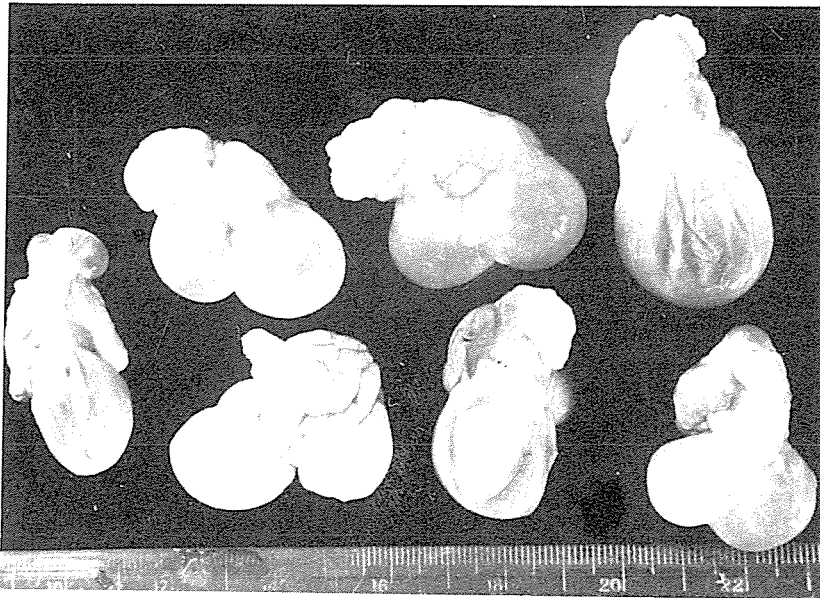


Fig. 24: Specimen of camel ovaries with different sized follicles. **

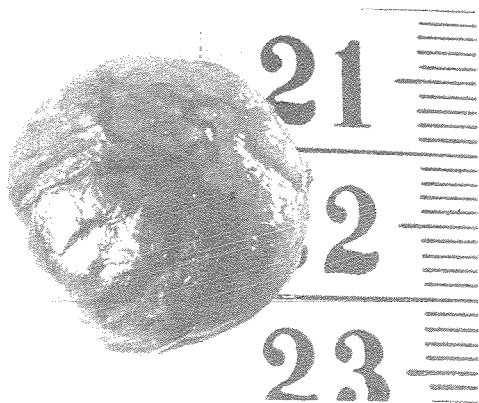


Fig. 25: Isolated corpus luteum of a camel. **

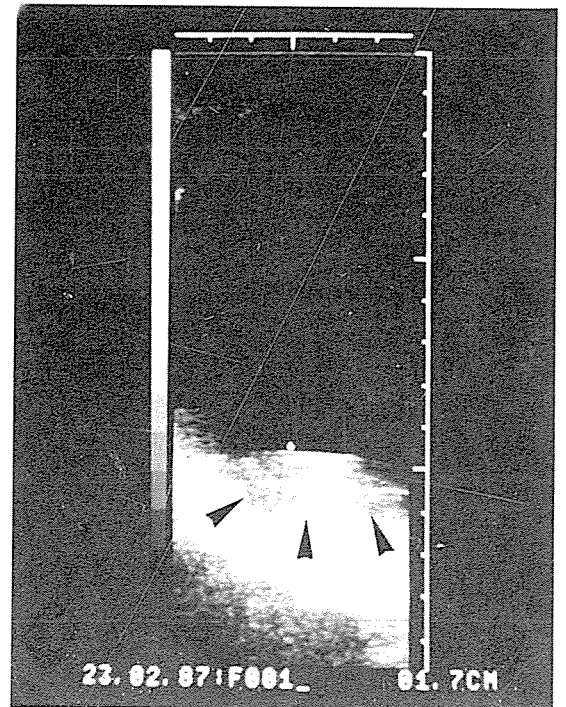


Fig. 26: Ultrasound picture of a seven weeks' pregnancy in the camel. **** The embryo is marked by the arrows.

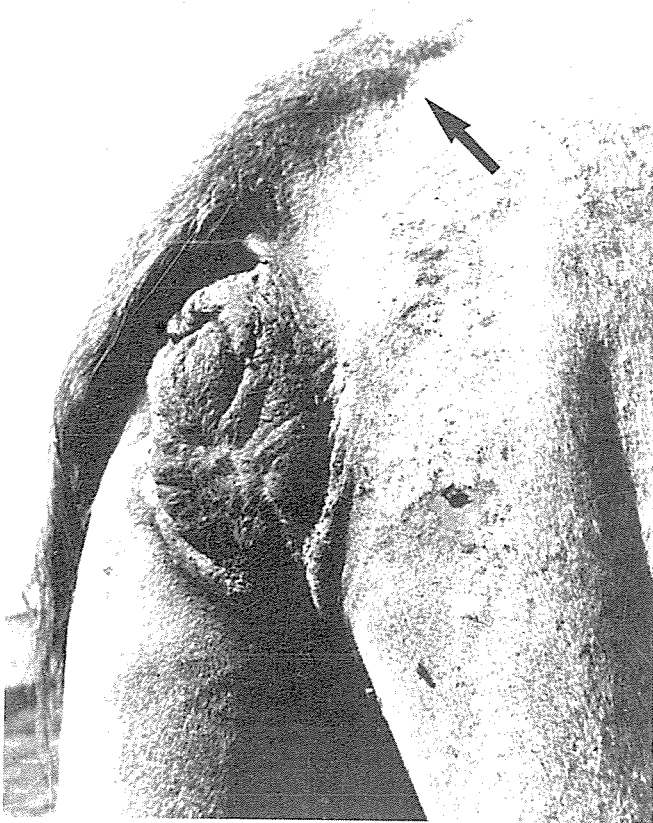


Fig. 27: Vulval labiae slightly swollen in a preparturient camel. Note the relaxation of the sacrosciatic ligament (arrow).**

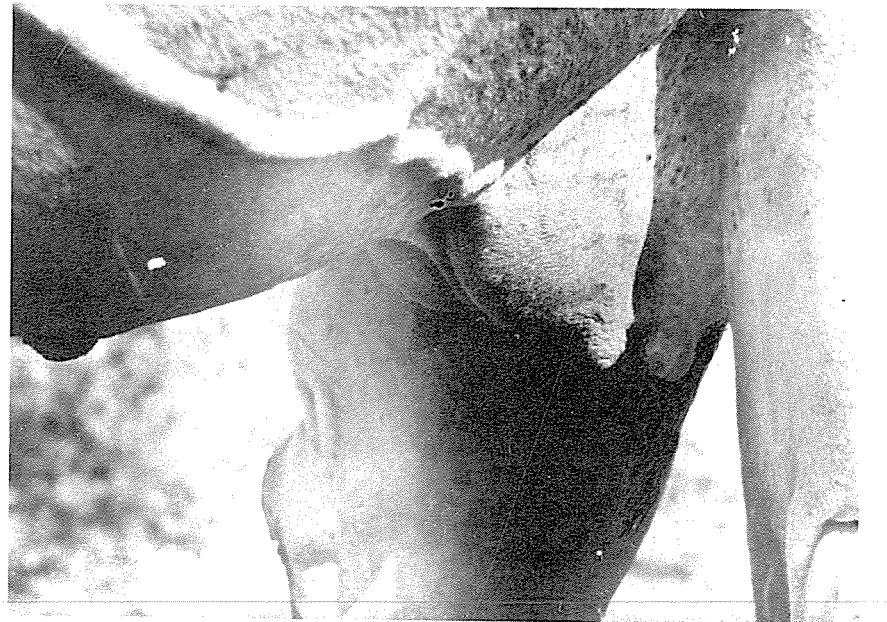


Fig. 28: Hypertrophy of the mammary gland in a preparturient camel. Note milk vein and tumefaction of the teats.**



Fig. 29: The bag is ruptured. The head and one leg appear. **

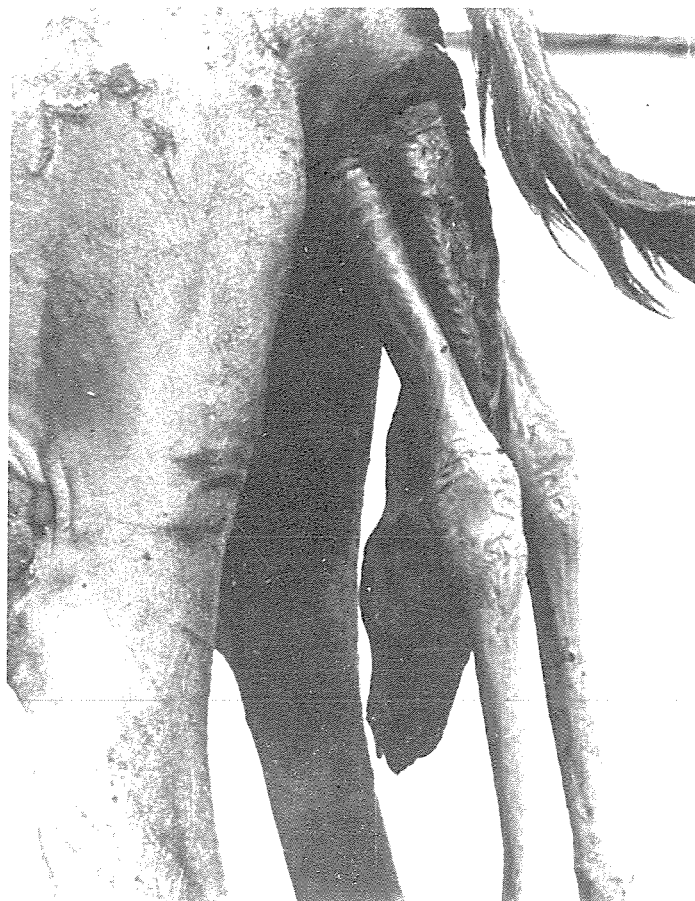


Fig. 30: Soon the foetus will slip down to the ground. **

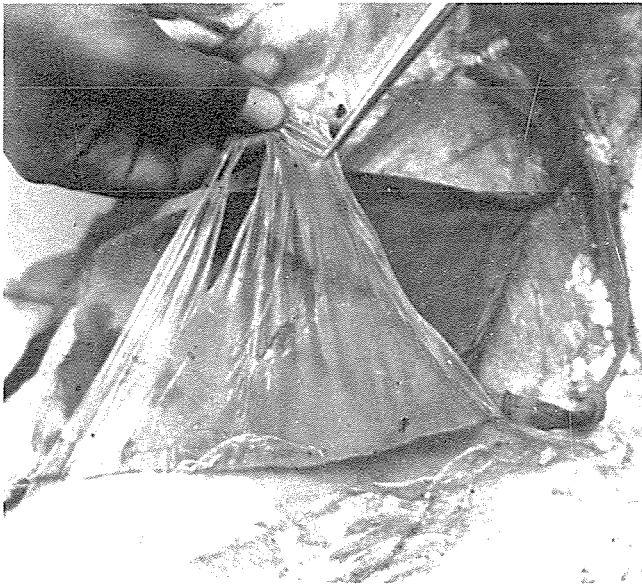


Fig. 31: The epidermal membrane, a unique phenomenon in the camelids.**



Fig. 32: The epidermal membrane (right) begins to be separated from the epidermis.**

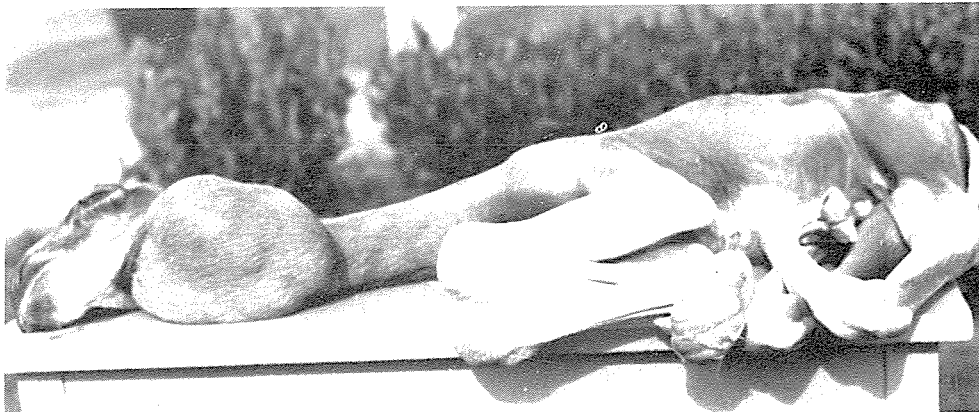


Fig. 33: Goitre and ankyllotic legs in a camel foetus.**



Fig. 34: Polydactilia in a camel foetus, a probable consequence of inbreeding.**

- * Photograph by D. Rath/Hannover
- ** " " B.E. Musa/Khartoum
- *** " " M.A. El-Naggar/Assiut
- **** " " E.A. Dafalla/Khartoum

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